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MONTHLY REVIEW

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MY CREED

To live as gently as I can;
To be, no matter where, a man,
To take what comes of good or ill
And cling to faith and honor still;
To do my best, and let that stand
The record of my brain and hand;
And then, should failure come to me,
Still work and hope for victory

EDGAR A. GUEST.

It is peculiar that Presidents don't do better. Heaven knows they receive plenty of advice from the newspapers.

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American Electro-Platers' Society

Editors' Office, 4156 Botanical Ave., St. Louis, Mo.

Vol. 7 NOVEMBER No. 12

NEW BRANCH FORMED AT READING, PA.

The following members of the Philadelphia Branch went to Reading Saturday night, October 23rd:

Messrs. Samuel Barr, Charles Bayer, C. E. Bamberg, J. L. Dinan, John B. Fay, P. Gorling, E. T. Homan, A. Kieser, D. A. Metz, G. H. Reif, M. Smith, H. Seaser, Philip Uhl, Wm. P. Scott and Wm. M. Fisher.

They held a very interesting and successful meeting at American Hotel, Fourth and Penn Streets, and formed the Reading Branch, with a membership of fifteen. This comprises over 50% of the foreman platers of Reading and means the sure success of the branch. The Philadelphia Branch brought along with them the following eminent authorities on the respective subjects connected with plating matters:

Dr. Hiram S. Lukens, of the University of Pennsylvania; on "The Action of the Current in Plating Solutions."

Mr. Floyd T. Taylor, electrical engineer; on the different types of Electro-Plating Generators, explaining the advantages of the Compound Wound over the Shunt Wound and the Interpole types.

Mr. L. E. Sturdevant, on the development of the Lacquer Industry and the use of the Lacquer in the Metal Finishing Trade.

Mr. J. E. Sterling, secretary and treasurer of the Supreme body of the society, also spoke on the advantages of the society to the plater, and ably assisted in the organization of this branch.

All of these gentlemen were given hearty applause, and their subjects proved not only of great interest, but of great value to all present.

All arrangements for this meeting and for the social and educational good of those attending, were in charge of the Membership Committee of the Philadelphia Branch—Mr. John B. Fay, chairman The committee is to be congratulated on its good work.

At a later meeting, Mr. L. J. Rathman was elected president, Mr. W. M. Fisher vice-president, Mr. C. H. Bingaman (127 Greenwich St., Reading, Pa.) secretary-treasurer, and Messrs. Howard Strunk, C. F. Harbester and F. E. Schadell, the trustees.

At this later meeting they appointed November 4th as the date for their first real meeting and sincerely trust that some of the older members of the society will make it a point to attend that meeting.

PHILIP UHL, Secretary.

NEW BRANCHES

Waterbury, Conn., November 5th, 1920.

Mr. Editor:

I have the honor to inform you that the Connecticut Valley Section of the American Electro-Platers' Society was organized in Hartford, Conn., last evening. The president is Mr. H. R. McFayden, 78 Hawthorne Street, Hartford, Conn. The secretary-treasurer is Mr. James A. Bagshaw, 39 Grand Street, New Britain, Conn.

The branch started with a charter membership of 23.

Yours very truly,

GEORGE B. HOGABOOM.

New York, N. Y., November 17th, 1920.

Mr. Editor:

I am pleased to report that I had the pleasure of assisting at the organizing of a new branch of our Society in the City of Reading, Pa., on October 23rd. We had a very enthusiastic meeting. We are handling this matter according to the new law, and as soon as the Supreme President O K's the applications with the answers to the references given by the candidates, which I have forwarded to him, they will obtain their temporary charter.

I am also pleased to say that a branch is formed in Montreal, Canada, and Hartford, Conn., which is to be known as the Connecticut Valley Branch. As soon as I receive the applications of the members of these new branches I shall send you the list for publication. While I write to the employers for the references, here are the officers pro tem of these new branches. (Conn. Valley is the baby.):

Reading Branch—Twelve members. President, L. J. Rathman; Secretary, C. H. Bingaman, 127 Greenwich Street, Reading, Pa.

Montreal Branch—Eighteen members. President, John H. Feeley; Vice-President, E. B. Davidson; Secretary-Treasurer, Andre Geroux, 48 Craig Street, West, Montreal, Canada; Librarian, J. B. Poole; Board of Trustees, N. Hepburn, F. A. Pombert, Jack Shaw, Ed. Young.

Connecticut Valley Branch—Twenty-three members. President, H. R. McFayden; Vice-President, Wm. H. Legate; Secretary-Treasurer, James A. Bagshaw, 39 Grand Street, New Britain, Conn.; Librarian, H. S. Whittier.

I might state that this membership is made up of platers from Meriden, New Britain, Hartford, Conn., and Springfield, Mass, with headquarters in Hartford.

In addition, I am boosting along the good work in Columbus, O.; Erie, Pa.; Jamestown, N. Y., and London, Canada, and I have just been informed that work is on foot to start a branch in Waterbury, Conn. So, take it all in all, I believe it will be a banner year for membership.

I am endeavoring to have the branch secretary of each branch send me a list of the changes in membership since August 31st, up to date, instead of a complete list for their second quarter's report, in order to save time and work. So far three or four have done so, and as soon as they pay their second quarter's P. C. I shall send you a list of the changes only, instead of the long membership list.

Yours sincerely,

JOHN E. STERLING, Supreme Secretary.

Please note the Supreme Secretary's new address: 468 Grand Avenue, Long Island City, N. Y.

NOTES ON THE USE OF HYDROFLUORIC ACID IN NICKEL SOLUTIONS

(Abstract of address delivered by Dr. Wm. Blum at the American Electro-Platers' Society, Rochester, July 1, 1920)

Within the last year the use of hydrofluoric acid in nickel baths has been recommended by Mr. E. G. Lovering, who obtained such remarkable results with it that he designated this acid as the "Magic Fluid." During the past year the Bureau of Standards has co-operated with the Bureau of Engraving and Printing in the development of an electrolytic process for the reproduction of engraved printing plates. In connection with this process, it was desirable to secure nickel deposits of great hardness and tensile strength to serve as a printing surface. We have therefore made a number of experiments upon the use of hydrofluoric acid in nickel baths and have obtained some results of possible interest to both electro-platers and electro-typers. The statements here made must in every case be considered as preliminary and subject to modification in the light of more exhaustive study, which we hope to conduct in the near future.

When appreciable quantities of hydrofluoric acid are added to a nickel solution it is not possible to obtain satisfactory deposits until the solution has been run for some time, in which process the hydrofluoric acid becomes at least partly neutralized. In order to permit an immediate production of satisfactory deposits, it is therefore desirable to neutralize the hydrofluoric acid in advance. From the standpoint of simplicity of composition of the solutions it is preferable to use nickel carbonate for such neutralization, and thereby avoid the introduction of other metals into the solution. This is equivalent to adding nickel fluoride to the solution, but since nickel fluoride is not an article of commerce, it must be prepared by treating nickel carbonate with hydrofluoric acid. (The experiments conducted since this address was given indicate that it may be more convenient and equally satisfactory to employ directly sodium fluoride in these solutions.)

If hydrofluoric acid is neutralized with nickel carbonate, there is first formed nickel fluoride which, in the presence of boric acid, probably forms fluoborates of more or less indefinite composition. It is not possible at this time to state what compounds are probably present in such a solution. It was found empirically, however, that the actual proportion of nickel carbonate required to combine with hydrofluoric acid in the presence of an excess of boric acid is approximately three parts of pure nickel carbonate to two parts of 100 per cent hydrofluoric acid. Since, however, the commercial hydrofluoric acid usually contains about 50 per cent of HF, and since the nickel carbonate frequently contains only about 80 per cent of $NiCO_3$, it is necessary to use approximately equal weights of nickel carbonate and hydrofluoric acid.

Up to this time no satisfactory methods have been found for the analysis of these solutions, but further work is in progress upon

this point. Until a suitable method is secured, it will be found most satisfactory to simply replenish the solutions by the use of stock solutions of similar compositions upon the assumption that any decrease in nickel content (which can be readily determined) is due principally to mechanical loss.

For purposes of comparison baths were prepared which contained equivalent amounts of chloride and fluoride. (Owing to the probable formation of fluoborates in Bath No 2, these two solutions are not strictly comparable, especially since some nickel hydroxide separates upon mixing nickel fluoride and boric acid.) For the chloride bath the following formula, which is very similar to that recommended by Dr. Watts, was employed:

Bath No. 1

		g/L	Oz./gal.
Nickel sulphate	1.8 normal	255	34
Nickel chloride	0.2 normal	24	3.2
Boric acid	0.5 molar	31	4.2

A corresponding fluoride bath was prepared from the following constituents:

Bath No. 2

		g/L	Oz./gal.
Nickel sulphate	1.8 normal	255	34
(Nickel fluoride	0.2 normal)		
Nickel carbonate		12	1.1
Hydrofluoric acid 50%		8	1.1
Boric acid	0.5 molar	31	4.2

A few experiments were made in solutions of fluoborate containing no nickel sulphate, and in those containing approximately equivalent amounts of nickel sulphate and nickel fluoborate. In neither of these were the deposits as satisfactory as those obtained in the solution No. 2, which contained about 10% of the nickel as fluoborate. We were unable to secure good deposits from solutions containing only nickel sulphate and nickel fluoride without any boric acid. From experiments conducted with solutions 1 and 2 the following tentative conclusions were drawn. In all cases anodes containing 95-97% nickel were used and most of the deposits were made upon smooth steel surfaces which had been treated with sodium sulphide to permit subsequent separation:

(a) The cathode efficiency in both the chloride and fluoride baths is nearly 100% even with current densities as high as 5 amp/dm² (50 amp/sq. ft.) The anode corrosion is better in the fluoride than in the chloride baths. The fluoride solutions remain almost entirely clear while in the chloride solutions a large amount of basic sludge separates.

(b) It is possible to obtain good deposits at a higher current density in the fluoride than in the chloride solutions.

(c) The resistance of the fluoride baths is slightly higher than that of the corresponding chloride baths.

(d) In every case under similar conditions the deposits from the fluoride bath are finer grained and have higher tensile strength

than deposits from the chloride bath. Deposits were obtained from the chloride bath with a tensile strength of 75,000 to 80,000 lb./sq. in., and from the fluoride bath of 100,000 to 133,000 lb./sq. in. The deposits from the chloride solution are softer and more ductile than from the fluoride.

In view of the greater hardness of the deposits from the fluoride bath, they are especially suitable for use upon surfaces requiring resistance to abrasion, such as upon printing plates and electrotype plates. Since the deposits are harder and therefore more difficult to buff, they may be found less suitable in electro-plating than softer deposits. In certain cases, however, their use may prove advantageous because higher current densities can be employed and brighter deposits may be secured.

After the presentation of his paper, Dr. Blum added:

"I neglected to mention, just to show that these experiments are not all test tube experiments, that we have had running a 50-gallon bath of this solution made up in this manner. And in that bath we have run 10 or 12 hours a day. And the solution has required practically no addition. We have made one addition in a month. Stop to consider running 120 amperes through a solution containing 50 gallons of solution, running it through 10 or 12 hours a day for a month, and you will agree with me that is a pretty severe test on the ability of the anodes to corrode the solution. When we get more satisfactory results, I shall try to get them ready for publication."

Q.: What is the effect of temperature?

B. (Dr. Blum): We have not made any specific experiments on the effect of temperature. Reference was made to the use of solutions at 60 degrees C., which is the temperature used in hot nickel solutions. We could not use it in our work because we had wax for installation, and so we were not interested in that. But we have no reason to question that the same principle would apply, if we had the same current density at a higher temperature. But we might be able to use a higher current density in a warmer solution and therefore get an equally hard deposit.

Q.: Is this work agitated or in still solution?

B.: All of the work is in still solution, but we could use a higher current density in an agitated solution.

Q.: I should like to ask whether there was any analysis made of the two different depositions, that is, the one taken from the fluoride bath and the other from the chloride bath?

B.: We have not had an opportunity to make any such analysis. We would predict from the behavior of the baths that practically the same amount of copper and iron that were present in the anodes were present in the deposition in the fluoride bath, while in the chloride bath we would have a pure nickel. Mr. Hogaboom called my attention to the fact that the few per cent of iron may account for some of the changes in the physical properties. But, on the other hand, the presence of iron in the electrolyte is not a

disadvantage. It would naturally be deposited otherwise the bath would become contaminated by iron or copper that might be in the anode. I think that would possibly change the structure of the deposit and have something to do with the additional strength.

Q.: What was the increase in temperature of the solution?

B.: That, of course, is going to be governed by the current and the volume of the solution. When we were passing 120 amperes through the 50-gallon solution, the temperature did not increase probably more than 10 or 15 degrees. It becomes warmer. Whereas, where we were running a higher current with a small bath, we do get some slight heating.

Mr. Proctor: I should like to ask if there would be any advantage in using magnesium sulphate in the chloride solution?

A.: I would not want to answer that question specifically unless I could answer the question whether magnesium salts are in general an advantage. In connection with our experiment, to avoid any effect due to the magnesium salts, we confined to the one metal—nickel—but I should like to get more information on that.

Mr. Hogaboom: In determining the effect of magnesium of sulphate or magnesium salt upon straight nickel sulphate ammonium chloride boric acid solution we did a great deal of work on measuring conductivity, and we found, much to our amazement, that magnesium sulphate is not a conducting salt. Two ounces of magnesium sulphate in a solution containing 3 ounces of metallic nickel decreases its conductivity 8%, and we made several runs to prove that. We did quite considerable work on that and we find magnesium sulphate retards. That is one explanation of why magnesium sulphate is an advantage in plating zinc. While we admit that a high voltage is necessary, or a high current deposit is necessary in plating zinc, there is an advantage in using a magnesium sulphate. Dr. Watts, a few years ago, spoke about magnesium sulphate decreasing the single potential of nickel. If you put zinc in a nickel solution the nickel will be precipitated chemically on the zinc. Magnesium sulphate decreases that effect, and therefore magnesium sulphate in the solution retards the current and prevents that chemical precipitation, and therefore you have more of a chance to get your nickel on your zinc before there is any chemical action, and therefore it is an addition that is advantageous to add in zinc plating.

Mr. Madsen: I have a laboratory with eight research men devoted exclusively to nickel, and in connection with the work we took up the question of the fluoride. The work was by no means thorough, in fact not nearly so exhaustive as that which Dr. Blum has done. We went far enough to prove the case negative for our purpose. In due justice I should explain that the object in view was totally different. I was not interested in protective or decorative coatings, but only in heavy deposits, but not necessarily hard or strong ones, but very pure ones.

In other words, I have been developing and nearly perfected for some time a process for making an extremely pure, and there-

fore highly ductile and very malleable nickel. We wish to see whether the addition of fluorides to our bath or the bath as recommended by Mr. Lovering, or any modification would produce any improvement or better results over what we were using. We found in general that it did not.

We went at it in a little different way than Dr. Blum has. We set up, in general, three baths which were run continuously for about 100 hours. The first one was in accordance with Mr. Lovering's formula. The second one was made with a neutral nickel fluoride and the third one was made by adding the fluoride to a bath essentially the same as Dr. Watt's.

We succeeded in getting a chemical manufacturer to make for us some neutral nickel fluoride, at least tested neutral by the litmus as well as the hydrogen-ion concentration tests. The point that we wished to determine first was whether any benefit, if produced, was caused by the presence of free acid or was the effect of a neutral fluoride. So the first bath was simply made by adding hydrofluoric acid, one and one-half ounces per gallon, to a bath containing about 24 ounces nickel sulphate per gallon and about four ounces boric acid. We used in that bath anodes of a ratio to the cathode surface which we had previously determined would maintain the bath practically neutral, and the bath was started and tested for acidity every day without any other changes. I am sorry I did not bring any of these cathodes with me, since I did not know that the matter was to be discussed at this time.

We found that the acidity decreased very rapidly at first and then very slowly. If I remember right it is a logrithmic curve, that is decreasing at nearly twice the ratio every day, so that at the end of about six days it became within the range of hydrogen-ion readings. But it took two weeks before it became neutral to the hydrogen-ion. There was a big change both in the appearance of the cathodes and the current and anode efficiency as the bath became neutral.

In running this bath we use our worse anodes, that is we use anodes which were known to behave poorly in a chloride bath. Those anodes were International Hot Rolled. That is an anode material which we have desired very much to make work, the reason being that it is a relatively pure and cheap one. It can be bought for a few cents over the best price of shot and 20% under the cost of anodes.

While the bath was acid, that is the first day those anodes dissolved with an efficiency of very close to 100%, but it did not reach 100, and I hardly know the scientific words for describing the cathode. The boys called it a piece of cheese. It was in an extremely poor physical condition, looking as though the metal had been thrown across in chunks rather than being dissolved, and I am sorry we did not try it with good anodes. We were not interested in that; we were already making those work.

That physical effect decreased as the bath approached neutrality. When it became neutral we got a good deposit, but nearly

with the same attendant trouble as we would have with the same anode in a neutral bath, namely, the efficiency drop to about 85%. In no case was the cathode over 100%, usually from 97% to 98%. In the strictly neutral bath that was made with a strictly neutral nickel fluoride acted practically the same as the first one did after it became neutral, and in the case of the addition of the hydrofluoric acid to the chloride bath and also the addition of the neutral nickel fluoride to the chloride bath we, in both cases, got worse deposits than we did with the bath without them; but in those cases they were with good anodes. That is, we did not try the International Hot Rolled.

So the work is incomplete and we made one run with the International Electrode as anode and obtained the same result as with the International Hot Rolled. That is, while the anode dissolved all right, the deposit was very far from being a smooth and regular metal. It was very rough and full of bunkles. In other words, as near as I could describe it roughly it looked as though it had received the same deposit on regular metal that it would without the chloride and that the changes of the hydrofluoric acid simply acted to throw the balance of the metal across in little chunks.

The reason that we abandoned it was, first, that the metal was not pure and not malleable. In no case did we obtain any malleable metal. It was always brittle, or at least not sufficiently malleable so that it could be rolled or made into wires, and we found the same results that have been mentioned, and that is that the iron and copper goes across with it, which is exactly the thing that we wanted to get away from and get a pure nickel.

And we found still another thing that I think is more important than all and that is that it did not eliminate pits.

It may be a little premature to say much about that and I do not know that I can do it without going into the methods by means of which we have been getting this malleable nickel, and I feel there is no time to do that this afternoon; but I will be glad to do it some other time. I may explain, however, in connection with that, that one thing we have found out is the nature of the pits. A great deal has been said about it and so many have claimed that they have found the cause and remedy that I hesitate to say definitely that we know what the cause is and have remedied it. But I can say that in the course of the research work we made upwards of five thousand cathodes, all of them 1/32 of an inch thick and that must be free from pits and must be comparable with a sheet of zinc metal so that it can be used as sheet metal, and in that work we finally traced all of the inherent troubles of nickel deposition, including pits, to the anode. And we found then in connection with the using of the fluorides that if the anode was of such a character that it made pits with the chloride bath, then it would also make them almost as much with the fluoride, and, in general, I do not quite agree with Dr. Blum that acidity has very much to do with pits. Our con-

clusions are that it is entirely a function of the anode as a basic cause. It is true, however, that acid will favor and increase the number of pits if the anode is of such a character that it tends to make them, but with anodes which do not make pits in a neutral bath, we can also get pitless stuff in a fairly acid bath.

And it therefore seemed to me that a better remedy for obtaining a pure and pitless and bunkle-free metal is to use the right kind of anodes. To do it by means of the fluoride, strikes me like putting dirt into a bath and putting something else to try to dissolve the dirt out again, so far as making a malleable and pure metal is concerned. I might only add as a matter of interest and show you what can be done with a chloride bath using anodes of somewhat different type than those ordinarily used. I will say this much about my process about making malleable nickel, that we have developed several processes and that the main one depends on the anode, and by means of that we get both the malleable and quite pure nickel. I have not examined Dr. Blum's sample very carefully, but I do not think it is quite as hard, although we get a tensile strength very nearly approaching that of about one hundred thousand per square inch, and in general, I feel that the increase of hardness in the metal from the fluoride bath can readily be duplicated in a chloride bath with the right anodes, if you want the iron in it. I feel that the increase in hardness is due to the fact that the deposit is not pure nickel, but is an alloy, the difference being that with fluoride present it is probably easier to control the effect of the hydrogen upon it.

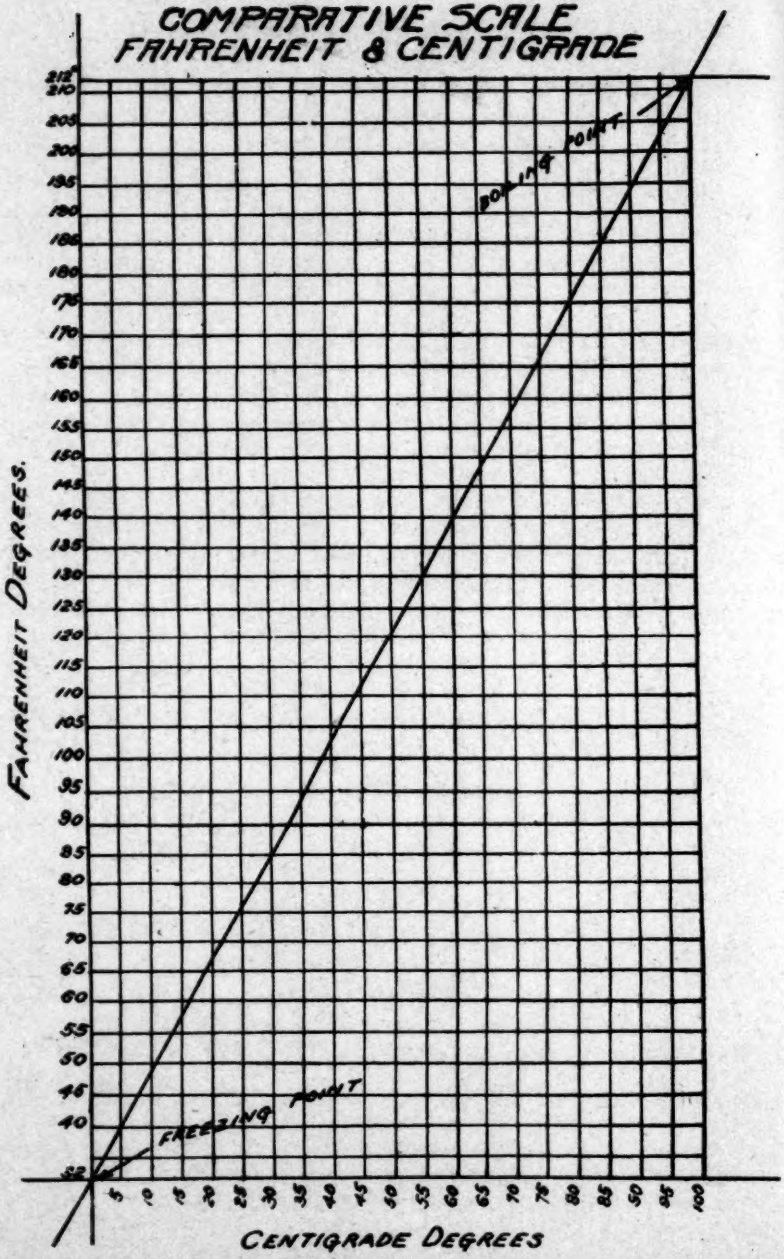
As a matter of general interest I have a couple of pieces I brought with me of our own deposits that I will pass around. I do not need to warn you to be easy with the surface. This one is a master or stamper.

(Discussion to be Continued)

BOOK REVIEW

"Electro-Deposition of Metals," Langbein & Brant 8th Edition, 1920—Henry Carey Baird, Inc., Publishers

From the foreword on the paper cover of the book and the descriptive circular, the electro-plater is led to believe that at last a real scientific and practical treatise on electro-plating has been published. A keen disappointment comes with the reading of the text which, from a grammarian's view, is poorly written; from a printer's standpoint is carelessly proofread; from an electro-plater's experience shows a lack of intimate knowledge of common practice; and, from a chemical engineer's demand for accuracy in chemial reactions and electrical results, is not what should be expected.



The temperature given in formulas from the various text-books and scientific journals is generally the Centigrade scale. This sometimes is confusing to many, and while the table of conversion from Centigrade to Fahrenheit is simple, yet it is not always available or easily remembered. The chart will be found a ready means for this purpose and sufficiently correct for any ordinary use. OSCAR E. SERVIS.

A few of the many errors are given:

The electro-plater is told that to obtain good results the metal must be in a state of "absolute purity" (page 271), and that an addition agent should have a "conducting resistance"—whatever that may be—(page 352). The electro-chemist will be interested in the statement (page 548) that a deposit is obtained "with an electro-motive force of 1.5 amperes," and that "the positive molecular particles wander with the direction of the current to the cathode" (page 52).

Manufacturers of silver-plated knives, forks, etc., will be surprised to learn that they deposit from 2.11 ozs. to 3.52 ozs. of silver on each dozen pieces, when the best trade demands on 18 dwt. on each dozen of steel table knives.

The chemist may read that in titrating with silver nitrate for the cyanide content of a solution an addition of a saturated solution of common salt should be added to the solution to be titrated (page 429), and that the atomic weight of nickel is 58.68 parts by weight (page 305); and also be interested in the reactions given in the following paragraph, which is but one of several which can be found in the book:

"A solution of nitrate of silver in sodium sulphite is, according to Roseleur, very suitable for silvering by immersion. The solution is prepared by pouring into moderately concentrated solution of sodium phosphite, while constantly stirring, solution of a silver salt until the precipitate of silver sulphide formed begins to be dissolved with difficulty . . . If, however, the bath is not capable of dissolving the silver sulphide formed, concentrated solution of sodium sulphite has to be added." (Page 607.)

It is to be regretted that the opportunity was lost to give the electro-plating industry a reliable book, which is very much needed at this time. The statements "It contains everything anyone wants to know about plating and finishing of metals of every description, and is practically an encyclopedia of the art"; and "The theoretical section leads up to a masterly discussion of the fundamental principles of electro-chemistry, and the sources of current used in electro-deposition, and makes the underlying principles so clear that anyone can understand the theoretical considerations on which all plating processes are based. This section is a treasure house of information for the student or the plater who desires to understand his art from A to Z" are not fulfilled, and the value of the book is certainly questionable.

GEO. B. HOGABOOM.

SUCCESSFUL METHODS.

Question No. 1. What effect on cyanide consumption has a copper solution that has insufficient anode surface?

Answer: The consumption is greater and more free cyanide must be used in order to get the same results.

Question No. 2: What dip can be used to take "fire" out of sterling silver.

Answer: Hot sulphuric acid; it was also suggested that if the parts had to be soldered, they should be covered with a 50-50 solution of boracic acid and borax, and thus prevent the scale forming all over the articles.

Question No. 3. What is a good method of depositing nickel on aluminum alloy that can be color buffed without cutting through?

Answer: Wash in gasoline, dry in sawdust, rinse in mild alkali cleaner, rinse in running water and put directly into a nickel solution with a moving cathode rod and plate long enough to stand good color buffing.

Question No. 4. What percentage of nickel does a nickel sludge contain when 95-97% anodes are used?

Answer: That depends entirely on the quality of anodes and how they are cast.

Question No. 5. Can small die castings be nickel plated in a mechanical plating barrel?

Answer: Yes, with a current pressure of 12 to 15 volts.

Question No. 6: Will an excess of carbonate of soda or hyposulphide of soda make a cyanide copper solution peel? What will cause the same solution to turn purple?

Answer: An excess of hypo will harden the deposit which will very likely peel. Insufficient cyanide will turn a copper solution purple, also blue. Some claim that the imported cyanide does the same and if it is used long enough the solution will turn blood red.

CHICAGO BRANCH.

Aluminum and Soft Black Oxidizing.

It is found necessary to have a good, clean black oxidize for cheap work. The oxidize must be deep and soft, enough to rub off without cutting through.

Aluminum oxidizing is not called for very often and few members have occasion to use same.

The different formulas and ways of using them make it necessary to coat aluminum with a more positive metal first, then plating and oxidizing top metal. No formula for oxidizing direct on metal has been found practical by members.

The soft black oxidize is secured in a number of ways. Some add ammonia, sal ammonia or sal soda. On small work for a cheap finish silver plating and oxidizing, as same time has been practiced. The formula for this solution was given some time back.

This solution is not recommended for large work or for French grey finish.

PROVIDENCE-ATTLEBORO BRANCH.

OUR LADY MEMBER

Our hearts are filled with deepest grief,
And crepe hangs on our door;
We've lost Miss Esther Zalia Jenckes,
We won't have her no more.

Our roster will not have that name,
From cover unto cover:
The lass has ditched that cognomen
And gone and took another.

Collectively we loved her much,
The A. E. S. united;
And like all guys that worship girls,
We thought it was requited.

'Twas ever thus since childhood's hours,
We loved some sweet gazelle;
And got thrown down and thrown down good,
Before we knew her well.

But trust that in her brand-new home,
The shares of power will balance;
For though the lady's moleculed,
We do not know the valence.

May happiness and joy surround
Our lady member daily,
The A. E. S. sends best regards
To Mrs. Walter Gaily.

H. J. RICHARDS.

No one is useless in this world who lightens the burdens of it for anyone else.—Dickens.

Question: Is there any disadvantage in using sodium carbonate to neutralize the acid in making silver cyanide from a silver nitrate solution?

Answer: No.

TORONTO BRANCH.

WHAT THE BRANCHES ARE DOING

Boston.

Meets first and third Fridays of each month, 8 p. m., at the Quincy House. Secretary, A. W. Garrett, 37 Dorset St., Dorchester, Mass.

Boston Branch met at the Quincy House, Boston, Saturday, Nov. 6, 1920, with President Mackie in the chair. After the reading of two applications for membership and the regular order of business had been disposed of, we had a report from the banquet committee. The committee was given full power to act and we will hold our first banquet at the Quincy House, Boston, on Lincoln's Birthday, Feb. 12, 1921. Every member has pledged his support to the committee to make the banquet a great success. Mr. Herrick is the chairman of the committee. After the reports of the committees the rest of the business was dispensed with.

We had with us one of the best known men in the American Electro-Platers' Society, Mr. Geo. Hogaboom of Bridgeport Branch, who gave us a very interesting talk on the working of brass solutions. It was one of the best talks that we have had, and we hope to have Mr. Hogaboom at our banquet. He told of the most troubles that platers have with their brass solutions and how to get the best results from the solution. A vote of thanks was extended to him.

After a little discussion on Mr. Hogaboom's talk and he had replied to several questions, we adjourned at 11 p. m.

Chicago.

Meets second Saturday of each month, 8 p. m., at the Briggs House, Randolph and Wells Sts., Secretary, Frank J. Hanlon, 2855 N. Richmond St., Chicago, Ill.

Regular meeting of the Chicago Branch was held, November 13th, with President Thornton presiding.

We elected one applicant to membership.

The banquet committee suggested that the Chicago Branch hold a strictly educational banquet and exclude the ladies. The suggestion was accepted and the committee was told to proceed with their plans.

Mr. R. J. Hazucha, who has become an associate member, resigned his position as secretary and treasurer.

Mr. F. J. Hanlon, 2855 N. Richmond St., was elected secretary and treasurer for the balance of the fiscal year.

After electing Mr. Hanlon as secretary, he resigned from the board of managers and Mr. H. G. Binder was elected to fill the vacancy.

The chair appointed tellers and a judge to count the referendum vote on the assistant foreman platers amendment and the results were sent to the supreme secretary.

We had the pleasure of having Mr. F. T. Taylor with us, and he gave us a talk on the structure of nickel anodes and electrical current which was very much appreciated. We also had Mr. C. C. Martel with us for the first meeting in several years. Mr. Martel is one of the first members of Chicago Branch and the boys made him feel at home for, after the meeting, he was heard to remark: "What a jolly bunch of platers these Chicago fellows are!"

The librarian had the following questions in his question box (see "Successful Methods"):

Cincinnati.

Meets on the first and third Friday of each month at Dennison Hotel. Secretary, W. J. Husing, 729 McMakin Ave., Cincinnati, O.

We are having good attendance at our two meetings each month.

On October 1st, R. H. Sleter gave us a talk on "Nickel Solutions" and on October 15th, Dr. Wiessman gave us a talk which was of great benefit to all that were present.

We will have something doing every meeting.

Detroit.

Meets first Friday in each month at Cass Technical High School, Platers' Classroom, 2nd Avenue and Beech Street, at 8 p. m. Secretary, E. G. Lovering, 635 Grand River Avenue, Detroit, Mich.

Regular monthly meeting held, Nov. 5, at Cass School; President Kutzen presiding; with a fair attendance.

Voting on the amendment appertaining to assistant foreman, was as follows: 27 Yes. 1 No.

General discussion on tin plating by simple immersion. Mr. Brockway described the process of "moodyizing" as practiced at the Ford Plant.

Our old friend, Archie McDermot, was a visitor, and gave a very interesting talk on tin plating as carried on in the large pin and novelty factories in the east. It was a "Broad Brack Moonlick Nicht" for Detroit Branch and Mr. McDermot's talk exemplified the benefits derived from associate members.

Mr. P. H. Bergin, wants to have his name appear in the Review again; so he arranged a paper on plating and handling die cast metal in mechanical plating machines—"Mode and Procedure."

Mr. Woodmansee brought up the question, "How can the loss of current, if any, be measured that flows through steam and water pipes which are grounded to the tank?" "Is it necessary to use insulating joint on steam coil in cleaner tank?"—open for discussion.

The plater's class at Cass School, is progressing nicely with 15 enrolled. Professor Phillips is working hard trying to inject his chemical knowledge into the class.

Mr. T. C. Eichstadt of New York Branch and Mr. A. Borrows of Bridgeport Branch were transferred to Detroit Branch.

Grand Rapids.

House. Secretary, J. B. Hawley, 1317 Jefferson Ave., Grand Rap-
Meets on the second Wednesday of the month at The Morton
ids, Mich.

Grand Rapids Branch meeting was held in their new room, at 129 Bostwick Ave., S. E.

This is the location of the Vocational High School, which at present occupies three rebuilt houses, but our school board will ask for funds for a new building. Our branch is plugging for the new building as we expect a permanent laboratory and an adjoining lecture room as our part of the new plant.

Mr. Frazee, principal of the school, addressed us before the regular meeting.

A very interesting paper was read by Secretary Hawley, on the subject of band instrument plating and aroused much discussion. Mr. Hawley exhibited a beautiful saxophone in silver and gold as an illustration of his skill.

The paper will be at the service of the society very soon.

Mr. Rickson and Mr. Poe of the Grand Rapids Show Case Co., also brought samples of their work—lamp shades and die castings in various finishes. Many questions were asked and satisfactorily answered.

A visitor present was Mr. Eichstaedt of the Detroit Branch.

Our branch will hold classes in Union High School again this coming term, a class for beginners on Friday night, and a special class for practical work in electro-plating, on Wednesday night. The practical class work will be experiments with and analysis of actual plating solutions, also testing of materials, etc.

We also voted to permit the beginners' class to attend on Wednesday nights.

Indianapolis.

Indianapolis Branch holds its business meeting the second Saturday in each month at Hotel Denison. Secretary, Louis Mertz, 1725 Union St., Indianapolis, Ind.

Indianapolis Branch held its regular meeting, Nov. 13th, with President Hennessey presiding. The attendance was small.

The educational program was postponed, owing to absence of the member scheduled to talk on mechanical polishing and plating

The vote was taken on the amendment to admit assistant platers as members. Result was 9 in favor of the amendment and 5 against it.

Newark.

Meets first, third and fifth Fridays of each month, 8 p. m., Foresters' Home, 20 Central Ave., Newark, N. J. Secretary, O. F. Carlson, 225 West Grand St., Rahway, N. J.

Regular meeting of the Newark Branch, was held on Oct. 15th, Vice-President Sizelove in the chair, and all officers present but one.

A communication was received from Superintendent Secretary Sterling, saying he was surprised at the small number of votes cast on the proposed amendment to admit assistants, and suggested that Newark Branch reconsider the action.

It was voted that the secretary be instructed to send return post-cards to each member for the purpose of recording their vote.

Also one from the Editor of the Brass World, asking that the secretary send a report of each meeting for publication in the Brass World.

Voted, that the request be complied with.

One former member was voted reinstated.

Past Supreme President C. H. Proctor was a visitor, and was called on for remarks. Mr. Proctor responded in his usual interesting way, taking as his subject: "The Value to the Plater of Subscribing to the Patent Gazette," saying that some of the new patents being issued are of much interest to the plater, reading specifications of some recent patents granted, some of which were electro-deposition of tin and of chemical coloring.

Mr. Fields was called on to explain further about his method of plating die castings, which he did to the full satisfaction of the members present.

Under the head of discussions, the subject of the evening was taken up, which was a paper on silver plating, by Mr. H. H. Smith, of Tiffany & Co., which covered the subject pretty thoroughly; a general discussion followed, during which Mr. Smith answered several questions.

Mr. Proctor also gave a very interesting talk on the subject.

Subject for next meeting: Acid copper plating, by Mr. O. J. Sizelove.

Regular meeting held on Nov. 5th, President Sievering in the chair and all officers present.

The subject for discussion was a paper on acid copper plating, by Mr. O. J. Sizelove, which covered the subject pretty thoroughly, giving formulas, directions for maintaining, analyzing, etc.

A general discussion followed, during which several questions were asked, and answered.

Mr. De Mars exhibited samples of electro-deposited tin, and explained in detail his methods, and giving formula, which was:

Tin chloride .....8 oz.
Caustic soda .....8 oz.
Cyanide .....1 oz.
Water .....1 gal

Temp. 160 F., current pressure 3 to 3½ volts, time 2 min.

It was voted that the chair appoint a committee to investigate the conditions about securing the use of the plating room and laboratory of the Newark Technical School.

Committee appointed: Mr. Rosenbaum, Mr. Smith, and Mr. Sizelove.

New York.

New York Branch of the American Electro-Platers' Society meets every second and fourth Fridays of each month at the Broadway Central Hotel Parlors, New York, N. Y. Secretary, John Burke, 110 Glen St., Brooklyn, N. Y.

President Sterling presided at the October meetings of New York Branch, Messrs. B. Nadel and H. Hotaling were elected active members of the New York Branch. One new application for active membership was received and referred to the Board of Trustees. Mr. F. F. Perdon was reinstated to active membership of New York Branch. Past President T. B. Haddow exhibited some very interesting deposits of tin. The deposits had all the necessary qualities required of a durable tin deposit. The following problems were discussed at the October meetings: Cobalt nickel plating, stereotype metal, nickel solutions for die castings, rapid nickel solutions, mat finishing aluminum, brighteners for zinc solutions and the cause of blistering in hot copper solutions.

Philadelphia.

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Sts. Secretary, Philip Uhl, 2432 North 29th St., Philadelphia.

Our regular monthly meeting was held, Nov. 5th, at the University of Pennsylvania, with President Metz in the chair and a good attendance. The vote on the assistant foreman clause was taken, the result being 14 yeas and 26 noes.

Three applicants were elected to active membership.

J. L. Kirkpatrick gave a short talk on barrel plating in nickel in a solution of double and single salts, magnesium sulphate and boracic acid, and Mr. Gehling spoke on brass barrel plating and the stock solution he uses to replenish the bath, which is: Water, 1 gallon; cyanide, 12 oz.; copper cyanide, 8 oz.; caustic soda, 2 5 oz.; zinc carbonate, 1.6 oz.; adding ½ oz. of aqua ammonia twice a day Both subjects were discussed with much interest.

Pittsburgh.

Meets every first Saturday at 8 p. m. at United States Bureau of Mines Building, Forbes St. Secretary S. E. Hedden, 227 5th St., Aspinwall, Pa.

Our regular meeting of November 6th was transferred from the United States Bureau of Mines to the new cafeteria of the National Casket Company. Our President, John Corbit, who had been "there" before, acted as toastmaster, for our Mr. George W. Dehn and Roy S. Prunkard, of the Casket Company, had worked hard all day getting things ready for the hungry platers and their friends, who came equal to the occasion, as well as our worthy visitors, who were Mr. Charles H. Proctor, the founder of the society, and Mr. Richard Slitor, of Cleveland, Ohio, who was one of the first presidents. Both made splendid addresses that were enjoyed by all. Mr. Proctor spoke on the rapid strides the platers were making these days in all lines of electro-deposition of metals, and passed around an article that had been electro-tinned. It could have been passed for silver. He touched on the Magic Fluid, as all know was introduced by Mr. Lovering of the Detroit Branch. The surprise of the evening came when Mr. Edgar Cornell, an honorary member, who is on the research staff of The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., came back at the Magic Fluid, reading notes on his work in the laboratory It upset some of the claims of Lovering, and these will be presented later, when all will have a chance to go over his tests.

After the dinner and smokes, remainder of the evening was taken up by a trip through the factory, an inspection of their new plating plant on the fourth floor taking most of the time. They have just recently installed a new plant. Everything is right up to date—lots of light that so many platers wish for, good floors and plenty of drains and ventilators. Every plater present took home with him some new ideas about how a new and modern plating plant should be equipped.

Mr. G. R. Richlous, assistant manager of the National Casket Co., was very much interested in our society, stating that we were on the right track in trying to help each other in our daily troubles. He took charge of the party and showed all how a casket began and the various stages of construction until finished. Most of the platers picked out the $3500 kind for their last resting place. On behalf of the National Casket Co., Mr. Richlous gave us a standing invitation to hold any or all meetings of the future in the cafeteria, which is appreciated.

Providence-Attleboro.

Meets first and third Thursdays of each month at 26 Custom House Street, Room 16. Secretary, Clayton J. Poyton, 269 Ohio Avenue, Providence, R. I.

Our branch held two well attended meetings in October.

Classes in chemistry and mathematics have started their winter sessions and the members are very interested in their work.

The proposed amendment to constitution relating to platers' assistants has been under discussion for some time and every effort has been made to poll a full vote. The returns will be in the hands of the supreme secretary by November 1.

The branch has decided to hold their fourth annual banquet in Providence, Saturday night, December 11, 1920, at Naragansett Hotel. We are seeking to have the manufacturers more fully realize the benefits that they receive from research work by the members and we are asking that they attend or send superintendents or foremen.

Those who have attended our banquet in the past know that Providence-Attleboro do all in their power to give all a good time, and we will certainly appreciate the attendance of members from other branches who are in Providence or vicinity, on Saturday night, December 11.

The subject for discussion at our meeting of October 21, was aluminum ox. and soft black ox. (See "Successful Methods.")

Our committee appointed to furnish material for Review reports that they are at work and will be heard from later.

Our next meeting will be held in Providence, the first Thursday in November.

St. Louis.

Meets third Saturday of each month at Barr Branch Library, corner Jefferson and Lafayette. Secretary, H. H. Williams, 4156 *Botanical Ave., St. Louis, Mo.*

Regular meeting held on November 20th, with a good attendance. It was decided to hold the annual banquet and dance and the following committees were appointed, and given full authority: E. J. Musick, chairman; H. J. Richards, H. Duebelbeis, G. Brandt and H. H. Williams.

Under educational features, papers on Copper Plating were read by H. J. Dumas and H. J. Richards. Both brought out considerable discussion. The result of several tests on the solubility of different forms of copper anodes used in a hot solution, was given by Mr. Dumas. Rolled anodes which were annealed, electrolytic sheet, extruded and cast eliptic gave best results in order named. It is no effort for Mr. Richards to talk on this subject, it is next to golf with him. These papers are being reserved for the St. Louis number of "The Monthly Review."

Toronto.

Meets second Thursday of each month at Occident Hall, Bathhurst and Queen Streets. Secretary, Chas. Kemish, 271 *Boston Avenue, Toronto, Ont.*

The October meeting of Toronto Branch was presided over by our President, Thos. O'Keefe, the usual number of members being present. One application for active membership was received.

We also had the pleasure of having Dr. J. F. Mackey, instructor of the platers' class at the Toronto Technical School, elected as an honorary member of our branch and trust that he will be as great a help to us in the future as he has been in the past.

At our November meeting a paper will be presented by Mr. John A. Magill on duplex copper plating, also a number of papers will be presented by Mr. Acheson, a member of the "committee on papers" appointed for the purpose of instructive entertainment.

Mr. Magill was elected librarian.

Rochester.

Meets on the fourth Fridays. Secretary, Sylvester Gartland, 128 Bryan Street, Rochester, N. Y.

Regular meeting of Rochester Branch was held October 22nd, with President Lopez presiding.

One application for active membership was received and accepted.

The canvass of vote on the amendment to take in assistant foremen platers as associate members is as follows: Total membership, 40. Not in favor, 30. In favor, 2. Not voting, 8.

Mr. Puffer submitted samples of black nickel on aluminum, plated in the following solution with low voltage:

Double nickel salts	5 lbs.
Ammonium chloride	1½ lbs.
Sodium sulphocyanate	1½ lbs.
Zinc sulphate	1 lb.
Sal soda	4 oz.
Water	10 gals.

The Ladies' Auxiliary of the Rochester Branch held a very successful Halloween party, Saturday evening, Oct. 30th, at the home of Mrs. R. K. Hutchings.

A good share of the members and their families were present in costume, the youngest guest being Emmanuel Lopez, aged six weeks, who certainly behaved beautifully.

Mr. Raymond Lopez, president of the branch, walked a chalk line and never fell off.

Mr. Thomas Jordan sang a most comical balled, entitled, "When You Haven't but Fifty Cents."

Mrs. Troxler and Mr. George Hesselink did the cake walk.

Mr. Harry Bernard gave an exhibition of fancy dancing.

Each and every one had their stunt to do and did it. Then came the lunch, which consisted of everything appropriate for the occasion.

The party was one long to be remembered by all who attended and Mrs. Hutchings as a hostess was one not to be outdone.

Mrs. Troxler as the fortune teller was O. K. in costume as well as telling the past, present and future.

The next meeting of the Auxiliary will be held at the home of Mrs. H. C. Bernard, 115 Roslyn St., Wednesday evening, November 17th.

ELECTED TO MEMBERSHIP

Boston.

Wm. F. Clohessy.....32 Union St., Charlestown, Mass.
John J. Dranie.....48 Read St., Worcester, Mass.
Charles H. Morton.....60 Columbia Ave., Waltham, Mass.

Newark.

Wm. J. Devote.....281 Lake St., Newark, N. J.
Dewitt Moore.....343 Belleville Ave., Newark, N. J.
Andrew Muller.....103 Sherman Ave., Newark, N. J.
Edward M. Ball.....107 Newton St., Newark, N. J.

New York.

Benjamin Nodel.....1314 Prospect St., Bronx, New York, N. Y.
Henry L. Hotaling..9148 92nd St., Woodhaven, Long Island, N. Y.

Philadelphia.

Gustav Kaufman.....160 N. 2nd St., Philadelphia, Pa.
Maxwell J. Schuck.....3809 N. Delhi St., Philadelphia, Pa.
Wm. V. Lutz.....522 S. 15th St., Reading, Pa.

Rochester.

Wallace A. Keefe.....310 Palmer St., Jamestown, N. Y.
Ellsworth E. Fitch.....351 Grant St., Buffalo, N. Y.
James A. Carroll.....11 Gladys St., Rochester, N. Y.

APPLICATIONS FOR MEMBERSHIP.

Boston.

Franklin W. Hobbs .....27 Lane St., Bangor, Me.
Philip Nelson.....80 Devon St., Roxbury, Mass.

Detroit.

Wilbur Preston.....1100 Stewart St., Owasso, Mich.

New York.

Chas. Giordano .....271 W. 126th St., New York, N. Y.

Philadelphia.

Joseph T. Berenato.....2213 Pierce St., Philadelphia, Pa.

Reading.

Frank G. Wells .....c/o Reading Knob Works, Reading, Pa.
Fred E. Shadell.....c/o Fleetwood Body Works, Fleetwood, Pa.
George Smith.....305a McKnight St., Reading, Pa.
Wm. E. Weand.....Box 341, Boyertown, Pa.
C. H. Bingaman,.....127 Greenwich St., Reading, Pa.
Frank V. Laird.....830 North Duke St., Lancaster, Pa.
James H. Hilbert.....174 Cotton St., Reading, Pa.
James G. Widmyer.....c/o Willson Goggles Co., Reading, Pa.